RM - Module -3

Descriptive Research Design:

As evident from the name, descriptive research is conducted to describe the business or market characteristics. The descriptive research mainly answers who, what, when, where and how kind of questions. It attempts to address who should be surveyed, what, at what time (pre and post-type of study), from where (household, shopping mall, market, and so on and how this information should be obtained (method of data collection). Descriptive designs are not capable of addressing any of the why questions associated with a given research problem.

Descriptive research can be explained as a statement of affairs as they are at present with the researcher having no control over variable. Moreover, "descriptive studies may be characterized as simply the attempt to determine, describe or identify what is, while analytical research attempts to establish why it is that way or how it came to be".

Descriptive research is "aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely than was possible without employing this method."

In its essence, descriptive studies are used to describe various aspects of the phenomenon. In its popular format, descriptive research is used to describe characteristics and/or behavior of sample population.

An important characteristic of descriptive research relates to the fact that while descriptive research can employ a number of variables, only one variable is required to conduct a descriptive study. Three main purposes of descriptive studies can be explained as describing, explaining and validating research findings.

For example, a consumer durable company has conducted a descriptive research to understand the consumption pattern for its product. Descriptive research has revealed that 80% of the customers are government employees, 10% are businessmen, and the remaining 10% are scattered in different segments of society. The research has also revealed that 70% of the customers are men and 30% are women.

Generally, Descriptive research involves two types of Research:
- ***Cross – Sectional Study***
- ***Longitudinal Study***

Cross – Sectional Study :

Cross-sectional study is popular in the field of business and marketing research. Cross, sectional research design involves the collection of information from a sample of a population at only one point of time. In this study, various segments of the population are sampled so that the relationship among the variables may be investigated by cross tabulation. Sample surveys are cross-sectional studies in which the samples happen to be a representative of the population. The cross-sectional study generally involves large samples from the population; hence, they are sometimes referred as "sample surveys."

Longitudinal Study:

Longitudinal study involves survey of the same population over a period of time. There is a well-defined difference between a cross-sectional study and a longitudinal study. In a longitudinal study, the sample remains the same over a period of time. In a cross‐sectional design, a representative sample taken from the population is studied at only one point of time. Addressing a question such as, "What is the effectiveness of an advertisement campaign for an air conditioner?" is an example of

cross-sectional study. Whereas, "How have consumers changed their opinion about the performance of air conditioner as compared with that last summer?" is an example of longitudinal study. Longitudinal surveys usually combine both extensive (quantitative) and intensive (qualitative) approaches."

Techniques/ methods of Descriptive research design:

1. observation
2. Case studies
3. Surveys .

Case studies: this approach is used to analyze a particular trend, event or condition. Here the researcher is supposed to narrow down a general subject of research and concentrate on a strategically chosen 'case' instead of randomly chosen participants. Case studies are a great way to develop a hypothesis.

Observation: this method of descriptive study is characterized by active participation of the researcher in the event of phenomenon that is being studied. The data collected through observation is descriptive and is in the form of notes, assimilated over a long duration, or recordings of behavior and communication of the group members. An essential factor to be remembered is that the researcher must not influence the behavior of the participants in any way.

Survey: surveys are popular amongst management students, especially in the field of marketing. Even government authorities use surveys at the local as well as national level to accumulate important demographic information. These are easy to design and the cost involved varies according to the scale of research.

Survey methods

1. **Questionnaires:**

Typically, a questionnaire is a paper-and-pencil instrument that is administered to the respondents. The usual questions found in questionnaires are closed-ended questions, which are followed by response options. However, there are questionnaires that ask open-ended questions to explore the answers of the respondents.

Questionnaires have been developed over the years. Today, questionnaires are utilized in various survey methods, according to how they are given. These methods include the self administered, the group-administered, and the household drop-off. Among the three, the self administered survey method is often used by researchers nowadays. The self-administered questionnaires are widely known as the mail survey method. However, since the response rates related to mail surveys had gone low, questionnaires are now commonly administered online, as in the form of web surveys.

2. **Interviews:**

Between the two broad types of surveys, interviews are more personal and probing. Questionnaires do not provide the freedom to ask follow-up questions to explore the answers of the respondents, but interviews do.

An interview includes two persons - the researcher as the interviewer, and the respondent as the interviewee. There are several survey methods that utilize interviews. These are the personal or face-to-face interview, the phone interview, and more recently, the online interview

Causal Research Design:

Causal research is conducted to identify the cause-and-effect relationship between two or more business (or decision) variables. Many business decisions are based on the causal relationship between the variables of interest.

For example, a cement manufacturing company is working on the assumption that the \increase in advertisement expenditure is going to increase the sales of the company. Although this assumption seems to be true, a strict validation of the assumption by conducting a formal research is essentially required.

As discussed, the descriptive research is able to answer who, what, when, where, and how kind of questions but not the **"why"** part of the question. The causal research is designed to address the why part of the question. Unlike the exploratory research but similar to the descriptive research, causal research is a well-structured research design. In this design, the independent variables are manipulated in a controlled environment to identify the causal relationship between two or more variables. It discovers the functional relationship between the causal factors and its predicted impact on the dependent variable under the research investigation

Advantages /significance/ benefits/ uses of Causal Research Design

- Main advantage of this design is researcher can determine cause and effect variables.

- It provides reliable result it means utilizing of quantitative measurement level, controlled environment and allocation procedure promote high reliability of outcomes.

- It provides helpful insight to researcher efforts can be beneficial to use for providing result to immediate concern.

- Under this research design has control over the variables.

Disadvantages /Limitations of Causal Research Design:

- This research design obtain artificial because most of experimental are conducted in laboratory.

- The casual research design can be having biased or prejudice – unrepresentative.

- Sometimes manipulation possible it means people know they are being observed than they may give answer that they think the researcher wants to hear rather than they fill and think of the subject.

- Uncertainty of reactions – in testing a human is always a chance whether they have answer and reaction are true or not true.

Experimentation

An experiment is a specialized research design where researchers study a relationship by directly manipulating subjects' values on the independent variable and measure subsequent changes in the values on the dependent variable.

In more formal language we say that the researcher controls the **assignment to treatment,** where the treatment is a particular level of the independent variable. *(Experimentation in the social sciences was largely modeled on clinical drug trials; hence, all kinds of IVs are commonly referred to as "treatments.")*

Empirical research studies begin with a hypothesis about the relationship between a:

- Dependent variable (DV)—the key outcome of interest.

- Independent variables (IVs)—the other factors thought to affect the dependent variable.

Variables can be any characteristic that is measurable, either directly or indirectly: features of the physical world, human behaviors, beliefs,

socio-political traits, etc. The goal of a controlled experiment is to collect data that either **supports** or **refutes** the hypothesized relationship.

Experiments can be defined as the systematic study in which a researcher controls or manipulates one or more independent (experiment) variable to test a hypothesis about the independent variable.

Independent variable- they are manipulated or controlled by the researcher.

Dependent variable – they are researcher has little or no control over the research process, but the researcher can't change.

Types / Classification of Experimental Research Designs

1. Laboratory / Controlled Experiments

This type of experiment is conducted in a well-controlled environment (not necessarily a laboratory), where accurate measurements are possible.

The researcher decides where the experiment will take place, at what time, with which participants, in what circumstances and using a standardized procedure. Participants are randomly allocated to each independent variable group.

Strength:

● It is easier to replicate (i.e. copy) a laboratory experiment. This is because a standardized procedure is used

● They allow for precise control of extraneous and independent variables. This allows a cause and effect relationship to be established.

Limitation:

● The artificiality of the setting may produce unnatural behavior that does not reflect real life, i.e. low ecological validity. This means it would not be possible to generalize the findings to a real life setting.

- Demand characteristics or experimenter effects may bias the results and become confounding variables.

2.Field Experiments/uncontrolled

Field experiments are done in the everyday (i.e. real life) environment of the participants. The experimenter still manipulates the independent variable, but in a real-life setting (so cannot really control extraneous variables)

Field experiments, like lab experiments, randomly assign subjects (or other sampling units) to either treatment or control groups in order to test claims of causal relationships.

The distinguishing characteristics of field experiments are that they are conducted real-world settings and often unobtrusively.

Strength:

- Behavior in a field experiment is more likely to reflect real life because of its natural setting, i.e. higher ecological validity than a lab experiment

- There is less likelihood of demand characteristics affecting the results, as participants may not know they are being studied. This occurs when the study is covert.

Limitation:

- There is less control over extraneous variables that might bias the results. This makes it difficult for another researcher to replicate the study in exactly the same way.

3. Before-and-after without control design:

In such a design a single test group or area is selected and the dependent variable is measured before the introduction of the treatment. The treatment is then introduced and the dependent variable is measured again after the treatment has been introduced. The effect of the treatment would be equal to the level of the phenomenon after the treatment minus the

level of the phenomenon before the treatment. The design can be represented thus:

The main difficulty of such a design is that with the passage of time considerable extraneous variations may be there in its treatment effect.

4. After-only with control design:

In this design two groups or areas (test area and control area) are selected and the treatment is introduced into the test area only. The dependent variable is then measured in both the areas at the same time. Treatment impact is assessed by subtracting the value of the dependent variable in the control area from its value in the test area.

This can be exhibited in the following form

The basic assumption in such a design is that the two areas are identical with respect to their behaviour towards the phenomenon considered. If this assumption is not true, there is the possibility of extraneous variation entering into the treatment effect. However, data can be collected in such a design without the introduction of problems with the passage of time. In this respect the design is superior to before-and-after without control design.

5. Before-and-after with control design

In this design two areas are selected and the dependent variable is measured in both the areas for an identical time-period before the treatment. The treatment is then introduced into the test area only, and the dependent variable is measured in both for an identical time-period after the introduction of the treatment.

The treatment effect is determined by subtracting the change in the dependent variable in the control area from the change in the dependent variable in test area.

This design is superior to the above two designs for the simple reason that it avoids extraneous variation resulting both from the passage of time and from non-comparability of the test and control areas. But at times, due to lack of historical data, time or a comparable control area, we should prefer to select one of the first two informal designs stated above.

Pre-experimental Research Design

In pre-experimental research design, either a group or various dependent groups are observed for the effect of the application of an independent variable which is presumed to cause change. It is the simplest form of experimental research design and is treated with no control group.

Although very practical, experimental research is lacking in several areas of the true-experimental criteria. The pre-experimental research design is further divided into three types

● **One-shot Case Study Research Design**

In this type of experimental study, only one dependent group or variable is considered. The study is carried out after some treatment which was presumed to cause change, making it a post test study.

● **One-group Pretest-posttest Research Design:**

This research design combines both posttest and pretest study by carrying out a test on a single group before the treatment is administered and after the treatment is administered. With the former being administered at the beginning of treatment and later at the end.

- **Static-group Comparison:**

In a static-group comparison study, 2 or more groups are placed under observation, where only one of the groups is subjected to some treatment while the other groups are held static. All the groups are post-tested, and the observed differences between the groups are assumed to be a result of the treatment.

Quasi-experimental Research Design

The word "quasi" means partial, half, or pseudo. Therefore, the quasi-experimental research bearing a resemblance to the true experimental research, but not the same. In quasi-experiments, the participants are not randomly assigned, and as such, they are used in settings where randomization is difficult or impossible.

This is very common in educational research, where administrators are unwilling to allow the random selection of students for experimental samples.

True Experimental Research Design

The true experimental research design relies on statistical analysis to approve or disprove a hypothesis. It is the most accurate type of experimental design and may be carried out with or without a pretest on at least 2 randomly assigned dependent subjects.

The true experimental research design must contain a control group, a variable that can be manipulated by the researcher, and the distribution must be random. The classification of true experimental design include:

- **The posttest-only Control Group Design:** In this design, subjects are randomly selected and assigned to the 2 groups (control and experimental), and only the experimental group is treated. After

close observation, both groups are post-tested, and a conclusion is drawn from the difference between these groups.

- **The pretest-posttest Control Group Design:** For this control group design, subjects are randomly assigned to the 2 groups, both are presented, but only the experimental group is treated. After close observation, both groups are post-tested to measure the degree of change in each group.

Sampling

While conducting research, a researcher has to collect data from various sources. Collecting data, relying on the entire population is neither feasible nor practical. Do, researcher has to select a sample instead of going in for complete census. A researcher faces problem in terms of the procedure of selecting a sample. First thing we need to keep in mind that sample contains only portion of the population and not the entire population. So, a proper sampling method should be used for selecting a sample.

Sampling is the most widely used tool for gathering important and useful information from the population. A researcher generally takes a small portion of the population for study, which is referred to as sample. ***The process of selecting sample form the population is called sampling.*** As a part of the research process, we collect information from the sample, apply statistical tools and techniques for the analysis, and make important interpretations on the basis of statistical analysis. Decisions are taken on the basis of this interpretation

Sampling methods

Probabilistic Sampling: In this method the chance of all units of getting selected as a sample is equal.

Non Probabilistic Sampling: In this method the chance of all units of getting selected as a sample is not equal.

Probabilistic Sampling

1. Simple random sampling

It is a completely random method of selecting subjects. These can include assigning numbers to all subjects and then using a random number generator to choose random numbers.

An example of a simple random sample would be the names of 25 employees being chosen out of a hat from a company of 250 employees. In this case, the population is all 250 employees, and the sample is random because each employee has an equal chance of being chosen.

2. Stratified Random Sampling

It involves splitting subjects into mutually exclusive groups and then using simple random sampling to choose members from groups.

Example of Stratified Random Sampling

Suppose a research team wants to determine the Average SPI of college students across the India. The research team has difficulty collecting data from all 21 million college students; it decides to take a random sample of the population by using 4,000 students.

Now assume that the team looks at the different attributes of the sample participants and wonders if there are any differences in SPIs and students' majors. Suppose it finds that 560 students are English majors, 1,135 are science majors, 800 are computer science majors, 1,090 are engineering majors, and 415 are math majors.

The team wants to use a proportional stratified random sample where the stratum of the sample is proportional to the random sample in the population.

Assume the team researches the demographics of college students and finds the percentage of what students major in 12% major in English, 28% major in science, 24% major in computer science, 21% major in engineering, and 15% major in mathematics. Thus, five strata are created from the stratified random sampling process.

The team then needs to confirm that the stratum of the population is in proportion to the stratum in the sample; however, they find the proportions are not equal.

The team then needs to resample 4,000 students from the population and randomly select 480 English, 1,120 science, 960 computer science, 840 engineering, and 600 mathematics students.

With those, it has a proportionate stratified random sample of college students, which provides a better representation of students' college majors in the India. The researchers can then highlight specific stratum, observe the varying studies of college students and observe the various grade point averages.

3. Systematic Sampling

It means that you choose every "nth" participant from a complete list. For example, you could choose every 10th person listed.

Due to limited funding, Lucas's boss, Alex, cannot send all of his employees; he must choose a group to go to the training. Alex owns 12 movie theaters and employs 200 people. He has 12 managers out of the 200 employees. Alex can use systematic random sampling to select the group of employees that will attend the training.

Alex can follow these steps to create a group from systematic random sampling:

- Create a list of employees
- Select a beginning number
- Select an interval
- Gather a list of employees based on the interval number
- First, Alex will need to create a list of his employees. Then, he will need to randomly decide which number to start his selection process.
- For this, Alex uses a random number generator to select which employee he will begin with. The random number generator produces the number 34. Now Alex needs to create an interval.
- First, he needs to decide how many employees he wants to send to the training. After reviewing his budget, Alex decides he can afford to send 20 employees to the training.
- To find the interval he needs, Alex can divide the total number of employees he has (the population size) by the number of employees he wants to send to the training (the sample size), like this:
  $200 / 20 = 10$
- This would make his interval 10, meaning that every 10th person after the 34th person would be selected until he had a total of 20 people.
- Therefore, the following people would be selected:
  34, 44, 54, 64, 74, 84, 94, 104, 114, 124, 134, 144, 154, 164, 174, 184, 194, 14, 24, 35
- The numbers 14, 24, and 35 are included here because in order to select 20 people, Alex will have to continue selecting every 10th person, even if that means starting back at the beginning of the list. The number 35 is included because the 34th person has already been selected at this point.

4. **Cluster Random Sampling**

It is a way to randomly select participants from a list that is too large for simple random sampling. For example, if you wanted to choose 1000 participants from the entire population of the U.S., it is likely impossible to get a complete list of everyone.

Instead, the researcher randomly selects areas (i.e. cities or counties) and randomly selects from within those boundaries.

An example of cluster sampling is area sampling or geographical cluster sampling.

5. **Multistage sampling**

It can be a complex form of cluster sampling because it is a type of sampling which involves dividing the population into groups (or clusters). Then, one or more clusters are chosen at random and everyone within the chosen cluster is sampled.

For example,

(first stage) household surveys conducted by the Australian Bureau of Statistics begin by dividing metropolitan regions into 'collection districts' and selecting some of these collection districts .

(second stage)The selected collection districts are then divided into blocks, and blocks are chosen from within each selected collection district .

(Third stage), dwellings are listed within each selected block, and some of these dwellings are selected.

This method makes it unnecessary to create a list of every dwelling in the region and necessary only for selected blocks. In remote areas, an additional stage of clustering is used, in order to reduce travel requirements.

Non-Probability sampling

Non-probability sampling is a sampling method in ==which not all members of the population have an equal chance of participating== in the study, unlike probability sampling. Each member of the population has a known chance of being selected. Non-probability sampling is most useful for exploratory studies like a pilot survey (deploying a survey to a smaller sample compared to pre-determined sample size). Researchers use this method in studies where it is impossible to draw random probability sampling due to time or cost considerations.

Types of non probability sampling

1. Convenience sampling:

Convenience sampling is a non-probability sampling technique where samples are selected from the population only because they are conveniently available to the researcher. Researchers choose these samples just because they are easy to recruit, and the researcher did not consider selecting a sample that represents the entire population.

Ideally, in research, it is good to test a sample that represents the population. But, in some research, the population is too large to examine and consider the entire population. It is one of the reasons why researchers rely on convenience sampling, which is the most common non-probability sampling method, because of its speed, cost-effectiveness, and ease of availability of the sample.

2. Consecutive sampling:

This non-probability sampling method is very similar to convenience sampling, with a slight variation. Here, the researcher picks a single person or a group of a sample, conducts research over a period, analyzes the results, and then moves on to another subject or group if needed. Consecutive sampling technique gives the researcher a chance to work

with many topics and fine-tune his/her research by collecting results that have vital insights.

3. Quota sampling:

Hypothetically consider, a researcher wants to study the career goals of male and female employees in an organization. There are 500 employees in the organization, also known as the population. To understand better about a population, the researcher will need only a sample, not the entire population. Further, the researcher is interested in particular strata within the population. Here is where quota sampling helps in dividing the population into strata or groups.

4. Judgmental or Purposive sampling:

In the judgmental sampling method, researchers select the samples based purely on the researcher's knowledge and credibility. In other words, researchers choose only those people who they deem fit to participate in the research study. Judgmental or purposive sampling is not a scientific method of sampling, and the downside to this sampling technique is that the preconceived notions of a researcher can influence the results. Thus, this research technique involves a high amount of ambiguity.

5. Haphazard Sampling:

where a researcher chooses items haphazardly, trying to simulate randomness. However, the result may not be random at all and is often tainted by selection bias.

An example of Haphazard Sampling would be standing on a busy corner during rush hour and interviewing people who pass by.

6. Snowball sampling:

Snowball sampling helps researchers find a sample when they are difficult to locate. Researchers use this technique when the sample size is small and not easily available. This sampling system works like the referral program. Once the researchers find suitable subjects, he asks

them for assistance to seek similar subjects to form a considerably good size sample.

Sources of data

Data collection is a process of collecting information from all the relevant sources to find answers to the research problem, test the hypothesis and evaluate the outcomes. Data collection methods can be divided into two categories: secondary methods of data collection and primary methods of data collection.

The data collection component of research is common to all fields of study including physical and social sciences, humanities, business, etc. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same.

Primary data

The researcher directly collects primary data from original sources. It is mainly collected by a researcher to address the research problem. In other words, these are not readily available from various sources; rather the researcher has to systematically collect data relevant to a pre-specified research problem. Primary data sources include information collected and processed directly by the researcher, such as observations, surveys, interviews, and focus groups. Companies generally take the time and allocate the resources required to gather primary data only when a question, issue or problem presents itself that is sufficiently important or unique that it warrants the expenditure necessary to gather the primary data. Primary data are original in nature and directly related to the issue or problem and current data.

Methods of primary data collection

1. Interviews:

Interview is a method of data collection that involves two groups of people, where the first group is the ==interviewer== (the researcher(s) asking questions and collecting data) and the ==interviewee== (the subject or respondent that is being asked questions). The questions and responses during an interview may be oral or written as the case may be.

Interviews can be carried out in 2 ways, namely; in-person interviews and telephonic interviews. An in-person interview requires an interviewer or a group of interviewers to ask questions from the interviewee in a face to face fashion.

It can be direct or indirect, structured or unstructured, focused or unfocused, etc. Some of the tools used in carrying out in-person interviews include a notepad or recording device to take note of the conversation—very important due to human forgetful nature.

Telephonic interviews, on the other hand, are carried out over the phone through ordinary voice call or video calls. The 2 parties involved may decide to use video calls like Skype to carry out interviews.

==A mobile phone, Laptop, Tablet or desktop computer with an internet connection is required for this.==

2. Surveys or Questionnaires

Surveys and questionnaires are 2 similar tools used in collecting primary data. They are a group of questions typed or written down and sent to the sample of study to give responses.

After giving the required responses, the survey is given back to the researcher to record. It is advisable to conduct a pilot study where the questionnaires are filled by experts and meant to assess the weakness of the questions or techniques used.

There are 2 main types of surveys used for data collection, namely; online and offline surveys. Online surveys are carried out using internet-enabled devices like mobile phones, PCs, Tablets, etc.

They can be shared with respondents through email, websites, or social media. Offline surveys, on the other hand, do not require an internet connection for it to be carried out.

3. Observation

Observation method is mostly used in studies related to behavioral science. The researcher uses observation as a scientific tool and method of data collection. Observation as a data collection tool is usually systematically planned and subjected to checks and controls.

There are different approaches to the observation method—structured or unstructured, controlled or uncontrolled.

- **Direct Observation**: In direct observation, the researchers directly observe the behavior of a subject and record it. For example, for observing purchase behavior of shopper for a tea packet, a researcher can stand in a big grocery store just aside the shelf that contains tea packets. He can systematically record the behavior of the shoppers such as their first pick (choice) from the shelf, their preference for the hard pack, jar pack, or poly pack; their inclination for a particular; brand; impact of price (as the shopper picks a pack and places it back on the shelf after seeing the price); and so on.

- **Indirect observation**: the researcher observes outcome of a behavior rather than observing the behavior. Indirect observation is a recent concept in systematic observation. It largely involves analyzing textual material generated either indirectly from transcriptions of audio recordings of verbal behavior in natural settings (e.g., conversation, group discussions) or directly from narratives (e.g., letters of complaint, tweets, forum posts). It may also feature

seemingly unobtrusive objects that can provide relevant insights into daily routines. All these materials constitute an extremely rich source of information for studying everyday life, and they are continuously growing with the burgeoning of new technologies for data recording, dissemination, and storage.For example, a researcher can count the number of Cups in which tea is consumed in a product demonstration to note the consumer preference for a particular brand or taste.

- **Structured Observation:** In a structured observation, a clear guideline is provided to the observer as what is to be observed and what is not to be observed. In this type of observational technique, observation IS being made on a pre-specified format or checklist.

  This format itself does not consist the observation points that are not important for the researcher. Structured observation is a suitable technique when the research problem is clearly defined and the information needed from the observation is clearly laid down.

- **Unstructured Observation:** As the name suggests, in an unstructured observation, the, Observer is free to observe what he feels is important for a research. No pre-Specified format or checklist is provided to the observer, and he or she almost makes a discretionary decision on what is to be observed and what must be dropped from the observation. In theory, all the behavior of the subjects can be recorded, but in practice, the observer applies his discretion.

- **Disguised Observation:** In disguised observation, the subject happens to be unaware that his or her behavior or action is being monitored by the observer. This type of observational technique is especially used because the subjects will exhibit natural behavior when they are unaware of the fact that they are being observed by an

observer. For example, for making a disguised observation in a big shopping mall, an observer may be disguised as a shopper.

- **Undisguised observation:** <mark>the subject happens to be aware that he or she is being observed by an observer</mark>. There is a debate among the researchers that the undisguised observation can bias the observation process or not. Few researchers are of the View that the undisguised observation can bias the observation process; others say that the observer effect on the observation process is not long lasting.

- **Mechanical observation:** in these techniques involve observation by a non-human device. <mark>These devices are many, for example, video camera, voice recorder, eye-movement recorder, scanners, and so on</mark>. In the field of business research, use of mechanical device has been becoming increasingly popular as these devices are free from the bias caused by human observer.

4. Experiments

An experiment is a structured study where the researchers attempt to understand the causes, effects, and processes involved in a particular process. This data collection method is usually controlled by the researcher, who determines which subject is used, how they are grouped and the treatment they receive.

5. Focus Groups

Focus Groups are gathering of 8 to 12 people with similar characteristics or who possess common traits. They seek open-ended thoughts and contributions from participants.

A focus group is a primary source of data collection because the data is collected directly from the participant. It is commonly used for market research, where a group of market consumers engage in a discussion with a research moderator.

Secondary data

Secondary data is data collected by someone other than the user. Secondary data are the data collected by a party not related to the research study but collected these data for some other purpose and at different time in the past. If the researcher uses these data then these become secondary data for the current users. These may be available in written, typed or in electronic forms. A variety of secondary information sources is available to the researcher gathering data on an industry, potential product applications and the market place. Secondary data is also used to gain initial insight into the research problem. Secondary data is classified in terms of its source – either internal or external. Internal, or in-house data, is secondary information acquired within the organization where research is being carried out. External secondary data is obtained from outside sources.

Secondary data sources include information that you retrieve through pre-existing sources such as research articles, Internet or library searches. Pre-existing data may also include examining existing records and data within the program such as publications and training materials, financial records, student/client data, and performance reviews of staff, etc.

Sources of secondary data

A) Internal source

1. **Accounting Records**: The basis for accounting records concerned with sales is the sales invoice. The usual sales invoice has a sizable amount of information on it, which generally includes name of customer, location of customer, items ordered, quantities ordered quantities shipped, Rupees extensions, back orders, discounts allowed and date.

2. **Sales Force Reports:** Sales force reports represent a rich and largely untapped potential source of marketing information. The word potential is

used because evidence indicates that sales personnel do generally not report valuable marketing information. Sales personnel often lack the motivation and/or the means to communicate key information to marketing managers. To obtain the valuable data available from most sales forces, several elements are necessary: (1) a clear, concise statement. repeated frequently, of the types of information desired; (5) a systematic, simple process for reporting the information; (3) financial and other rewards for reporting information; and (4) concrete examples of the actual use of the data.

3. **Internal Experts**: One of the most overlooked sources of internal secondary data is internal experts. An internal expert is anyone employed by the firm who has special knowledge. The following statement by a senior research manager at a major consumer goods firm describes why his organization developed a research reports library and how they ensure its use. On the average, each brand is assigned a new brand manager every two years

B) External sources of secondary data collection

1. **Database**s: A computerized database is a collection of numeric data and/or information that is made computer-readable form for electronic distribution. There are than 3,500 databases available from over 550 on-line service enterprises. Those that are available that are useful in bibliographic search, site location, media planning, market planning, forecasting and for many other purposes of interest to marketing researchers.

2. **Associations:** Associations frequently publish or maintain detailed information on industry sales, operating characteristics, growth patterns and the like. Furthermore, they may conduct special studies of factors

relevant to their industry. These materials may be published in the form of annual reports, as part of a regular trade journal or as special reports. In some cases, they are available only on request from the association. Most libraries maintain reference works, such as the Encyclopedia of Associations that list the various associations and provide a statement of the scope of their activities.

3. **Government Agencies:** Central, state, and local government agencies produce a massive amount of data that are of relevance to marketers. In this section, the nature of the data produced by the central government is briefly described. However, the researcher should not overlook state and local government data. There are also a number of specialized analytic and research agencies, numerous administrative and regulatory agencies, and special committees and reports of the judicial and legislative branches of the government. These sources produce five broad types of data of interest to marketers. There are data on (a) population, housing and income; agricultural, industrial and commercial product sales of manufacturers, wholesalers, retailers and service organizations; (c) Financial and other characteristics of firms; employment and (e) miscellaneous reports.

4. **External Experts**: External experts are individuals outside your organization whose job provides them with expertise on your industry or activity. State and government officials associated with the industry, trade association officials, editors and writers for trade and publications, financial analysts focusing on the industry, government and university researchers and distributors often have expert knowledge relevant to marketing problems.

5. **Other Published Sources:** There is a virtually endless array of periodicals, books, dissertations, special reports, newspapers, and the like that contain information relevant to marketing decisions.

**One word question answer Module - 3 Chapter -1**
Sr. No	Question	Answer
1	Why descriptive research is conducted?	to describe the business or market characteristics.
2	To what type of questions descriptive research answer to?	who, what, when, where and how kind of questions
3	_____ can be explained as a statement of affairs as they are at present with the researcher having no control over variable.	descriptive research
4	_____ is "aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely than was possible without employing this method."	descriptive research
5	How many types of research descriptive research involves?	2
6	What are the names of research involved by descriptive research?	longitudinal & cross sectional
7	_____research design involves the collection of information from a sample of a population at only one point of time.	cross sectional
8	What samples cross-sectional study generally involves from population?	large
9	Cross sectional study also known as _____	sample surveys.
10	_____ involves survey of the same population over a period of time.	logitudinal study
11	In which study the sample remains the same over a period of time?	logitudinal study
12	How many methods of Descriptive research design?	3
13	Name the methods under descriptive research design?	observation, case study, survey
14	Which approach is used to analyze a particular trend, event or condition?	case study
15	The data collected through observation is _____	descriptive

16	In what form data is collected in observation?	notes, assimilated over a long duration, or recordings of behavior
17	How many methods of survey are there?	2
18	What are the names of survey methods?	questinnaire & interview
19	How many types of questionnaire are there?	2
20	Name the types of questionnaire.	open ended & close ended
21	The self-administered questionnaires are widely known as the _____.	mail survey method
22	How many person in an interview generally include?	2
23	What the researcher called in interview method?	interviewer
24	What are respondent called in interview method?	interviewee
25	What are the different types of interview?	personal, telephonic, online
26	_____ is conducted to identify the cause-and-effect relationship between two or more business (or decision) variables.	Causal research
27	_____ provides helpful insight to researcher efforts can be beneficial to use for providing result to immediate concern.	Causal research
28	In which research design researchers study a relationship by directly manipulating subjects' values on the independent variable and measure subsequent changes in the values on the dependent variable?	experimentation
29	_____ are manipulated or controlled by the researcher.	Independent variable
30	_____ has little or no control over the research process, but the researcher can't change.	dependent variable

31	_____ type of experiment is conducted in a well-controlled environment (not necessarily a laboratory), where accurate measurements are possible.	controlled experiment
32	controlled experiment is also know as _____	laboratory experiment
33	In which experiment researcher decides where the experiment will take place, at what time, with which participants, in what circumstances and using a standardized procedure?	controlled experiment
34	Field experiment is also called as _____	uncontrolled experiment
35	_____ are done in the everyday (i.e. real life) environment of the participants.	field experiment
36	In which research design a group or various dependent groups are observed for the effect of the application of an independent variable which is presumed to cause change?	pre-experimental research design
37	In which experimental study, only one dependent group or variable is considered?	One-shot Case Study Research Design
38	_____ research design combines both posttest and pretest study by carrying out a test on a single group before the treatment is administered and after the treatment is administered.	One-group Pretest-posttest Research Design
39	What is the meaning of quasi?	partial/half
40	What is the meaning of pseudo?	quasi
41	_____ relies on statistical analysis to approve or disprove a hypothesis.	true experimental research design
42	What is sampling?	only portion of the population
43	A researcher generally takes a small portion of the population for study, which is referred to as _____	sample
44	The process of selecting sample form the population is called _____	sampling

45	How many sampling methods are there?	2
46	What are the name of sampling methods?	probabilistic & non probabilistic
47	In which method the chance of all units of getting selected as a sample is equal?	probabilistic
48	In which method the chance of all units of getting selected as a sample is not equal?	non probabilistic
49	Which probabilistic method include assigning numbers to all subjects and then using a random number generator to choose random numbers?	simple random
50	_____ splitting subjects into mutually exclusive groups and then using simple random sampling to choose members from groups.	stratified random sampling
51	_____ sampling method means that you choose every "nth" participant from a complete list. For example, you could choose every 10th person listed.	systematic sampling
52	_____is a way to randomly select participants from a list that is too large for simple random sampling.	cluster random sampling
53	_____sampling is most useful for exploratory studies like a pilot survey	Non-probability
54	In which sampling, samples are selected from the population only because they are conveniently available to the researcher?	convenience sampling
55	In which sampling researcher picks a single person or a group of a sample, conducts research over a period, analyzes the results, and then moves on to another subject or group if needed?	consecutive sampling
56	In which sampling method, researchers select the samples based purely on the researcher's knowledge and credibility?	judgemental sampling
57	Judgmental sampling is also called as _____	Purposive sampling

58	What type of sampling is used when researcher has less time?	Haphazard Sampling
59	_____ helps researchers find a sample when they are difficult to locate.	Snowball sampling
60	What is a process of collecting information from all the relevant sources to find answers to the research problem, test the hypothesis and evaluate the outcomes?	data collection
61	In how many parts data collection method is divided?	2
62	Name the data collection method.	primary & secondary
63	The researcher directly collects primary data from_____	original source
64	Name few primary data collection methods.	observations, surveys, interviews, and focus groups
65	How many groups or people are involved in interview mthod?	2
66	What is the name of researcher group in interview method?	interviewer
67	What is the name of respondent group in interview method?	interviewee
68	A group of questions typed or written down and sent to the sample of study to give responses is called as_____	survey or questionnaire
69	_____ method is mostly used in studies related to behavioral science.	Observation
70	In which type o observation the researchers directly observe the behavior of a subject and record it?	direct observation
71	In _____ the researcher observes outcome of a behavior rather than observing the behavior.	indirect observation
72	In which type of observation, a clear guideline is provided to the observer as what is to be observed and what is not to be observed?	structured
73	In _____ Observer is free to observe what he feels is important for a research.	unstructured observation

74	In which the subject happens to be unaware that his or her behavior or action is being monitored by the observer?	disguised observation
75	In which observation the subject happens to be aware that he or she is being observed by an observer?	undisguised observation
76	In which type of observation equipments like video camera, voice recorder, eye-movement recorder, scanners are used?	mechanical observation
77	How many members are there in focus group method?	12-Aug
78	_____data is data collected by someone other than the user.	secondary
79	In which form secondary data is available?	written, typed or in electronic forms.
80	Secondary data is also classified into _____source	external & internal
81	Internal is also called as _____	in-house data
82	Accounting records is a _____ source of data.	internal
83	What type of information sales force report provdes?	marketing information
84	Who can be considered as internal expert?	anyone employed by the firm who has special knowledge
85	_____ is a collection of numeric data and/or information that is made computer-readable form for electronic distribution.	computerised database
86	Who frequently publish or maintain detailed information on industry sales, operating characteristics, growth patterns etc?	associations
87	Periodicals, books, dissertations, special reports, newspapers etc are examples of _____	secondary data

Measurement and Scaling

In our day to day life, we are said to measure when we use some yardstick to determine the weight, height or some other feature of a physical object.

We also measure when we judge how well we ==like a song, a painting or the personalities of our friends and whom we admire/heroes.== We, thus, measure physical objects as well as abstract concepts.

Measurement means assigning numbers or other symbols to characteristics of objects according to certain pre-specified rules.

– One-to-one correspondence between the numbers and the characteristics being measured.

– The rules for assigning numbers should be standardized and applied uniformly.

– Rules must not change over objects or time.

Scale of measurement/Four measurement data

Research is a continuous process. Thousands of researchers are collecting data every day for specific purposes. All the data collected for these purposes cannot be analyzed in the same statistical way because the entities represented by the numbers are different. For this purpose, a researcher has to have proper knowledge in the levels of data measurement, represented by numbers that are to be analyzed.

Therefore, there is a need to understand the concept of scale of measurement to use an appropriate statistical tool and technique, based on different scales of measurement. Basically, the followings are the 4 common data measurement scales used:

● **Nominal Scale**
● **Ordinal Scale**
● **Interval Scale**

● **Ratio Scale**

1. Nominal scale

If data are labels or names used to identify the attribute of an element, then the nominal scale is used.

For example, assume that a marketing research company wants to conduct a survey in three towns of India: Bhopal, Nagpur, and Baroda. Numeric code is as

Bhopal code – 1 Nagpur code - 2 Baroda code – 3

In this case, 1, 2, and 3 are the labels used to identify the three different towns. Data show the **numeric value,** but the scale of measurement is nominal. In other words, we cannot say that the Numeric Code 1 indicates any ranking or any rating; this is only for the sake of convenience in identification. Employee identification numbers, contributory provident fund numbers, personal identification number, and so on are some examples of nominal data. Nominal level measurement is the lowest level of data measurement.

2. Ordinal scale

The ordinal scale can be used to rank or order objects.

For example, a manufacturing company administers a questionnaire to 150 consumers to obtain the consumer perception for one of its products. Each consumer is asked to judge between three given options:

Excellent - 1

Good -2

Poor -3

For the sake of interpretation convenience, rankings are set in reverse. In this case, "1" will be used for poor, "2" for good, and "3" for excellent.

Therefore, the lowest number has the lowest ranking and the highest number the highest ranking.

The exact difference between these numeric values cannot be measured in any of these cases. The nominal and ordinal level data measurements are often used for general measurements such as demographic questions, ranking of items under the study and so on. This is why these data are termed as non-metric data and are referred as qualitative data.

3. Interval scale

An interval scale is also called a cardinal scale which is the numerical labeling with the same difference among the consecutive measurement units. With the help of this scaling technique, researchers can obtain a better comparison between the objects.

In interval scales, numbers form a continuum and provide information about the amount of difference, but the scale lacks a true zero. The differences between adjacent numbers are equal or known. If zero is used, it simply serves as a reference point on the scale but does not indicate the complete absence of the characteristic being measured. The Fahrenheit and Celsius temperature scales are examples of interval measurement. In those scales, 0 °F and 0 °C do not indicate an absence of temperature.

4. Ratio scale

Ratio scales have all of the characteristics of interval scales as well as a true zero, which refers to complete absence of the characteristic being measured. Physical characteristics of persons and objects can be measured with ratio scales, and, thus, height and weight are examples of ratio measurement. A score of 0 means there is complete absence of height or weight. A person who is 1.2 metres (4 feet) tall is two-thirds as tall as a 1.8-metre- (6-foot-) tall person. Similarly, a person weighing 45.4 kg (100 pounds) is two-thirds as heavy as a person who weighs 68 kg (150 pounds).

1. What is your height in feet and inches?

Less than 5 feet.

5 feet 1 inch – 5 feet 5 inches

5 feet 6 inches- 6 feet

More than 6 feet

3. How much time do you spend daily watching television?

Less than 2 hours

3-4 hours

4-5 hours

5-6 hours

More than 6 hours

Criteria of good measurement

1. Validity

An attitude, measure has validity if it measures what it supposed to measure. In fact, **Validity is the ability of an instrument to measure what is designed to measure.** It sounds simple that a measure should measure what it is supposed to measure but has a great deal of difficulty in real life.

For example, behavior of employees to measure consumer satisfaction in a big shopping mall is a validity issue. It is always possible that the behavior of employees is not a determinant of consumer satisfaction rather various other factors such as pricing policies, discount policy, parking facility, and others may be responsible for generating consumer satisfaction. Hence, the measure that was designed to measure consumer satisfaction from "employees' behavior" may not be a valid measurement tool.

Types of validity

1. Content validity

Content validity is the extent to which a ==measuring instrument provides adequate coverage of the topic under study.== If the instrument contains a representative sample of the universe, the content validity is good.

Its determination is primarily judgemental and intuitive. It can also be determined by using a panel of persons who shall judge how well the measuring instrument meets the standards, but there is no numerical way to express it.

For eg. A mathematics teacher develops an end-of-semester algebra test for her class. The test should cover every form of algebra that was taught in the class. If some types of algebra are left out, then the results may not be an accurate indication of students' understanding of the subject.

Similarly, if she includes questions that are not related to algebra, the results are no longer a valid measure of algebra knowledge.

2. Criterion validity

The criterion validity is the ability of the variable to predict the key variables or criteria. **It involves the determination of whether the scale is able to perform up to the expectation with respect to the other variables or criteria.** Criterion variables may include demographic and psycho-graphic characteristics, attitudinal and behavioral measures, or scales obtained from other scales.

For example, a researcher has developed a new measuring instrument to assess the consumer satisfaction based on "offering snack during shopping." Now a researcher will be willing to be sure that this new measurement is correlated with the other traditional measures of consumer satisfaction such as price, discount, after-sales services, and so on. In accordance with the time sequence, the criterion validity is classified as a concurrent validity and a predictive validity.

3. Construct validity

<mark>The construct validity is the initial concept, idea, question, or hypothesis that determines which data are to be generated and how they are to be gathered.</mark> Construct validity is about ensuring that the method of measurement matches the construct you want to measure.

For eg. If you develop a questionnaire to diagnose depression, you need to know: does the questionnaire really measure the construct of depression? Or is it actually measuring the respondent's mood, self-esteem, or some other construct?

To achieve construct validity, you have to ensure that your indicators and measurements are carefully developed based on relevant existing knowledge. The questionnaire must include only relevant questions that measure known indicators of depression.

2. Reliability

<mark>Reliability refers to whether or not you get the same answer by using an instrument to measure something more than once.</mark> In simple terms, research reliability is the degree to which research method produces stable and consistent results.

A specific measure is considered to be reliable if its application on the same object of measurement number of times produces the same results.

1. Test-retest reliability relates to the measure of reliability that has been obtained by <mark>conducting the same test more than one time over period of time with the participation of the same sample group</mark>.

Example: Employees of ABC Company may be asked to complete the same questionnaire about   employee job satisfaction two times with an

interval of one week, so that test results can be compared to assess stability of scores.

2. Parallel forms reliability relates to a measure that is obtained by conducting assessment of the same phenomena with the participation of the same sample group via <mark>more than one test method.</mark>

Example: The levels of employee satisfaction of ABC Company may be assessed with questionnaires, in-depth interviews and focus groups and results can be compared.

3. Inter-rater reliability as the name indicates relates to the measure of sets of <mark>results obtained by different researcher using same methods.</mark> Benefits and importance of assessing inter-rater reliability can be explained by referring to subjectivity of assessments.

Example: Levels of employee motivation at ABC Company can be assessed using observation method by two different assessors, and inter-rater reliability relates to the extent of difference between the two assessments.

Other Scaling methods

1. Comparative

In comparative scaling there is a **direct comparison of stimulus object**. **For example**, the respondent might be asked directly about his preference between the ink pen and gel pen. The comparative data can only be interpreted in relative terms and hence possess the ordinal or rank-order properties. This is the reason why the comparative scaling is

also called as <mark>nonmetric scaling</mark>. The Comparative Scaling includes the following techniques:

2. Paired comparison

A paired comparison symbolizes <mark>two variables from which the respondent needs to select one</mark>. This technique is mainly used at the time of product testing, to facilitate the consumers with a comparative analysis of the two major products in the market.

To compare more than two objects say comparing P, Q and R, one can first compare P with Q and then the superior one (i.e., one with a higher percentage) with R.

For example, A market survey was conducted to find out consumer's preference for the network service provider brands, A and B. The outcome of the survey was as follows:

Brand 'A' = 57%

Brand 'B' = 43%

Thus, it is visible that the consumers prefer brand 'A', over brand 'B'.

3. Rank order

In rank order scaling the respondent <mark>needs to rank or arrange the given objects according to his or her preference</mark>. For example, A soap manufacturing company conducted a rank order scaling to find out the orderly preference of the consumers. It asked the respondents to rank the following brands in the sequence of their choice:

SOAP BRANDS	RANK
Brand V	4
Brand X	2

SOAP BRANDS	RANK
Brand Y	1
Brand Z	3

The above scaling shows that soap 'Y' is the most preferred brand, followed by soap 'X', then soap 'Z' and the least preferred one is the soap 'V'.

4. Constant sum

It is a scaling technique where a continual sum of units like dollars, points, chits, chips, etc. is given to the features, attributes and importance of a particular product or service by the respondents.

For example, The respondents belonging to 3 different segments were asked to allocate 50 points to the following attributes of a cosmetic product 'P':

ATTRIBUTES	SEGMENT 1	SEGMENT 2	SEGMENT 3
Finish	11	8	9
Skin Friendly	11	12	12
Fragrance	7	11	8
Packaging	9	8	10
Price	12	11	11

From the above constant sum scaling analysis, we can see that:

- Segment 1 considers product 'P' due to its competitive price as a major factor.
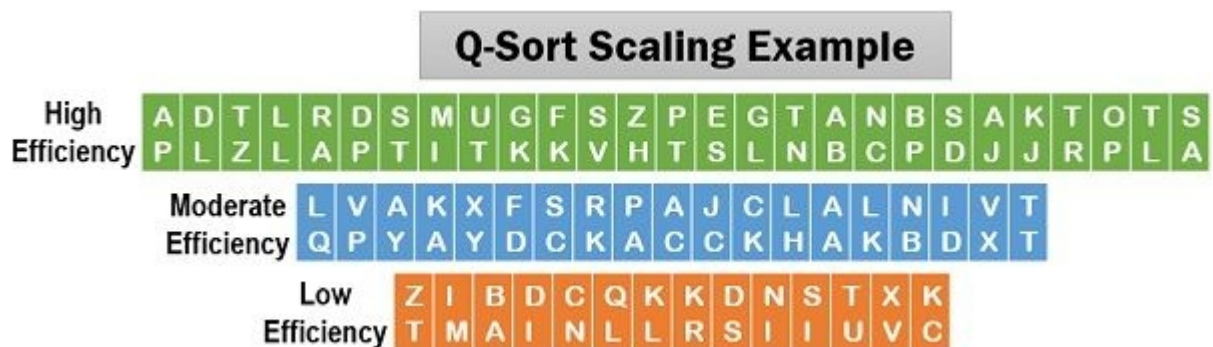- But segment 2 and segment 3, prefers the product because it is skin-friendly.

5. Q sort scaling

Q-sort scaling is a technique used for sorting the most appropriate objects out of a large number of given variables. It emphasizes on the ranking of the given objects in a descending order to form similar piles based on specific attributes.

It is suitable in the case where the number of objects is not less than 60 and more than 140, the most appropriate of all ranging between 60 to 90

For example, The marketing manager of a garment manufacturing company sorts the most efficient marketing executives based on their past performance, sales revenue generation, dedication and growth.

The Q-sort scaling was performed on 60 executives, and the marketing head creates three piles based on their efficiency as follows:

Q-Sort Scaling Example

| High Efficiency | A | D | T | L | R | D | S | M | U | G | F | S | Z | P | E | G | T | A | N | B | S | A | K | T | O | T | S |
| | P | L | Z | L | A | P | T | I | T | K | K | V | H | T | S | L | N | B | C | P | D | J | J | R | P | L | A |

| Moderate Efficiency | L | V | A | K | X | F | S | R | P | A | J | C | L | A | L | N | I | V | T |
| | Q | P | Y | A | Y | D | C | K | A | C | C | K | H | A | K | B | D | X | T |

| Low Efficiency | Z | I | B | D | C | Q | K | K | D | N | S | T | X | K |
| | T | M | A | I | N | L | L | R | S | I | I | U | V | C |

In the above diagram, the initials of the employees are used to denote their names.
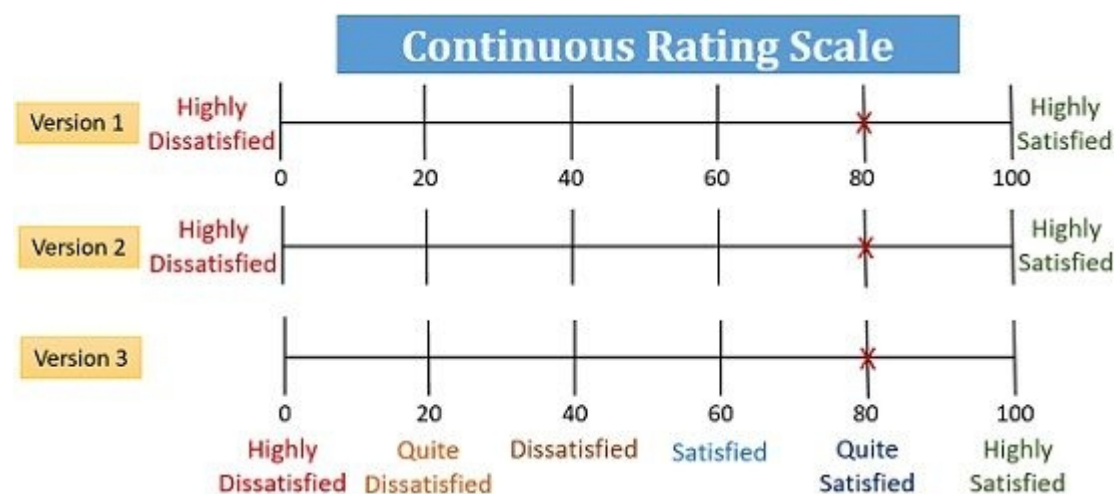
6. Non-comparative scale

A non-comparative scale is used to analyse the performance of an individual product or object on different parameters. Following are some of its most common types:

1. Continuous rating scale

It is a graphical rating scale where the respondents are free to place the object at a position of their choice. It is done by selecting and marking a point along the vertical or horizontal line which ranges between two extreme criteria.

For example, A mattress manufacturing company used a continuous rating scale to find out the level of customer satisfaction for its new comfy bedding. The response can be taken in the following different ways (stated as versions here):

The above diagram shows a non-comparative analysis of one particular product, i.e. comfy bedding. Thus, making it very clear that the customers are quite satisfied with the product and its features.

2. Itemized rating scale

Itemized scale is another essential technique under the non-comparative scales. It emphasizes on choosing a particular category among the various given categories by the respondents. Each class is briefly defined by the researchers to facilitate such selection.

The three most commonly used itemized rating scales are as follows:

- **Likert Scale**: In the Likert scale, the researcher provides some <mark>statements and ask the respondents to mark their level of agreement or disagreement</mark> over these statements by selecting any one of the options from the five given alternatives.

  For example, A shoes manufacturing company adopted the Likert scale technique for its new sports shoe range named Z sports shoes. The purpose is to know the agreement or disagreement of the respondents.

  For this, the researcher asked the respondents to circle a number representing the most suitable answer according to them, in the following representation:

- 1 – Strongly Disagree
- 2 – Disagree
- 3 – Neither Agree Nor Disagree
- 4 – Agree
- 5 – Strongly Agree

STATEMENT	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
Z sports shoes are very light weight	1	2	3	4	5
Z sports shoes are extremely comfortable	1	2	3	4	5

STATEMENT	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
Z sports shoes look too trendy	1	2	3	4	5

- **Semantic Differential Scale:** A <mark>bi-polar seven-point non-comparative rating scale</mark> is where the respondent can mark on any of the seven points for each given attribute of the object as per personal choice. Thus, depicting the respondent's attitude or perception towards the object.

For example, A well-known brand for watches, carried out semantic differential scaling to understand the customer's attitude towards its product. The pictorial representation of this technique is as follows:

From the above diagram, we can analyze that the customer finds the product of superior quality; however, the brand needs to focus more on the styling of its watches.

● **Staple scale**

A staple scale is a variation of the semantic differential scale; however each item consists of just one word or phrase on which respondents rate the attitude object using a 10 – item scale with just numerical labels.

The **staple scale** is generally presented vertically with a single adjective or phrase in the centre of positive and negative ratings.

For e.g.

The respondent is asked to rank the quality of food, and crew member service of an airline on a scale ranging from -5 to +5:

```
        +5                              +5
        +4 X                            +4
        +3                              +3 X
        +2                              +2
        +1                              +1
High Food Quality               Poor Crew Service
        -1                              -1
        -2                              -2
        -3                              -3
        -4                              -4
        -5                              -5
```

From the above example, the airline is evaluated as having a high food quality but somewhat a poor cabin crew services.

Questionnaire designing

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A research questionnaire is typically a mix of close-ended

questions and open-ended questions. Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts. <mark>Research questionnaires were developed in 1838 by the Statistical Society of London.</mark>

The data collected from a data collection questionnaire can be both <mark>qualitative as well as quantitative in nature</mark>. Questionnaires provide a relatively cheap, quick and efficient way of obtaining large amounts of information from a large sample of people. Data can be collected relatively quickly because the researcher would not need to be present when the questionnaires were completed. This is useful for large populations when interviews would be impractical.

However, a problem with questionnaires is that respondents may lie due to social desirability. Most people want to present a positive image of themselves and so may lie or bend the truth to look good, e.g., pupils would exaggerate revision duration.

Characteristics of good questionnaire

1. Valid

<mark>A valid questionnaire should ask what it intends to ask, i.e. the questions should be phrased in such a way that the respondent understands the objective of the question</mark>. To achieve this, the questionnaire should be reviewed by the "content expert" during the pilot test (e.g. if the target respondent is a diabetic patient, then a diabetic patient should comment whether he understands the questionnaire). Any uncertainties and queries should be clarified till the question is clearly understood.

2. Reliable

A reliable questionnaire should yield the same answer if the same question is posed to the respondent repeatedly in a short span of time. This can be achieved by performing a "test-retest", i.e. administer the same questionnaire to the respondent a second time and check for consistency of the answer. Any discrepancy in the answers could be due to lack of clarity of the questions and this should be reviewed and rephrased.

3. Interesting

An interesting questionnaire is more likely to be completed by the respondent and hence yields a better response rate. This requires the researcher to put some thoughts into asking questions that are relevant to the respondent and in a logical sequence.

4. Compact

A compact questionnaire asks questions that aim to answer only the research objectives. Any questions beyond the scope of the research should be excluded. It is common for researchers to "cast the net wider" so that they will collect more data, regardless of whether these data are important or not. This usually happens when the researcher has not properly thought through the research objectives. It runs the risk of asking too many questions and the questionnaire runs into many pages.

5. **Exploratory:** It should be exploratory to collect qualitative data. There is no restriction on questions that can be in your questionnaire. For example, you use a data collection questionnaire and send it to the female of the household to understand her spending and saving habits relative to the household income. Open-ended questions give you more insight and

allow the respondents to explain their practices. A very structured question list could limit the data collection.

Types of questionnaires

As we explored before, questionnaires can be either structured or frese-flowing. Let's take a closer look at what that entails for your surveys.

Structured Questionnaires: Structured questionnaires collect quantitative data. The questionnaire is planned and designed to ==gather precise information.== It also initiates a formal inquiry, supplements data, checks previously accumulated data, and helps validate any prior hypothesis.

Unstructured Questionnaires: Unstructured questionnaires collect qualitative data. They use a basic structure and some branching questions but nothing that limits the responses of a respondent. The questions are more open-ended to collect specific data from participants.

Types of questions in a questionnaire

Open-Ended Questions: Open-ended questions help collect qualitative data in a questionnaire where the respondent can answer in a free form with little to no restrictions.

Dichotomous Questions: The dichotomous question is generally a "yes/no" close-ended question. This question is usually used in case of the need for necessary validation. It is the most natural form of a questionnaire.

Multiple-Choice Questions: Multiple-choice questions are a close-ended question type in which a respondent has to select one (single-select multiple-choice question) or many (multi-select multiple choice question)

responses from a given list of options. The multiple-choice question consists of an incomplete stem (question), right answer or answers, incorrect answers, close alternatives, and distractors. Of course, not all multiple-choice questions have all of the answer types. For example, you probably won't have the wrong or right answers if you're looking for customer opinion.

Scaling Questions: These questions are based on the principles of the four measurement scales – nominal, ordinal, interval, and ratio. A few of the question types that utilize these scales' fundamental properties are rank order questions, Likert scale questions, semantic differential scale questions, and Stapel scale questions.

Pictorial Questions: This question type is easy to use and encourages respondents to answer. It works similarly to a multiple-choice question. Respondents are asked a question, and the answer choices are images. This helps respondents choose an answer quickly without over-thinking their answers, giving you more accurate data.

Steps Involved in Questionnaire Design

1. **Specify the Information Needed:** The first and the foremost step in designing the questionnaire is to specify the information needed from the respondents such that the objective of the survey is fulfilled. The researcher must completely review the components of the problem, particularly the hypothesis, research questions, and the information needed.

2. **Define the Target Respondent:** At the very outset, the researcher must identify the target respondent from whom the information is to be collected. The questions must be designed keeping in mind the type of respondents under study. Such as, the questions that are appropriate for serviceman might not be appropriate for a businessman. The less diversified respondent group shall be selected because the more diversified the group is, the more difficult

it will be to design a single questionnaire that is appropriate for the entire group.

3. **Specify the type of Interviewing Method:** The next step is to identify the way in which the respondents are reached. In personal interviews, the respondent is presented with a questionnaire and interacts face-to-face with the interviewer. Thus, lengthy, complex and varied questions can be asked using the personal interview method. In telephone interviews, the respondent is required to give answers to the questions over the telephone. Here the respondent cannot see the questionnaire and hence this method restricts the use of small, simple and precise questions. The questionnaire can be sent through mail or post. It should be self-explanatory and contain all the important information such that the respondent is able to understand every question and gives a complete response. The electronic questionnaires are sent directly to the mail ids of the respondents and are required to give answers online.

4. **Determine the Content of Individual Questions:** Once the information needed is specified and the interviewing methods are determined, the next step is to decide the content of the question. The researcher must decide on what should be included in the question such that it contribute to the information needed or serve some specific purpose. In some situations, the indirect questions which are not directly related to the information needed may be asked. It is useful to ask neutral questions at the beginning of a questionnaire with intent to establish respondent's involvement and rapport. This is mainly done when the subject of a questionnaire is sensitive or controversial. The researcher must try to avoid the use of double-barreled questions. A question that talks about two issues simultaneously, such as Is the Real juice tasty and a refreshing health drink?

5. **Overcome Respondent's Inability and Unwillingness to Answer:** The researcher should not presume that the respondent can provide accurate responses to all the questions. He must attempt to overcome the respondent's inability to answer. The questions must be designed in a simple and easy language such that it is easily understood by each respondent. In situations, where the respondent is not at all informed about the topic of interest, then the researcher may ask the filter questions, an initial question asked in the questionnaire to identify the prospective respondents to ensure that they fulfil the requirements of the sample. Despite being able to answer the question, the respondent is unwilling to devote time in providing information. The researcher must attempt to understand the reason behind such unwillingness and design the questionnaire in such a way that it helps in retaining the respondent's attention.

6. **Decide on the Question Structure:** The researcher must decide on the structure of questions to be included in the questionnaire. The question can be structured or unstructured. The unstructured questions are the open-ended questions which are answered by the respondents in their own words. These questions are also called as a free-response or free-answer questions.

   While, the structured questions are called as closed-ended questions that pre-specify the response alternatives. These questions could be a multiple choice question, dichotomous (yes or no) or a scale.

7. **Determine the Question Wording:** The desired question content and structure must be translated into words which are easily understood by the respondents. At this step, the researcher must translate the questions in easy words such that the information received from the respondents is similar to what was intended.

In case the question is <mark>written poorly, then the respondent might refuse to answer it or might give a wrong answer</mark>. In case, the respondent is reluctant to give answers, then "nonresponse" arises which increases the complexity of data analysis. On the other hand, if the wrong information is given, then " response error" arises due to which the result is biased.

8. **Determine the Order of Questions:** At this step, the researcher must decide the sequence in which the questions are to be asked. The opening questions are crucial in establishing respondent's involvement and rapport, and therefore, these questions must be interesting, non-threatening and easy. Usually, the open-ended questions which ask respondents for their opinions are considered as good opening questions, because people like to express their opinions.

9. **Identify the Form and Layout:** The format, positioning and spacing of questions has a significant effect on the results. The layout of a questionnaire is specifically important for the self-administered questionnaires. The questionnaires must be divided into several parts, and each part shall be numbered accurately to clearly define the branches of a question.

10. **Reproduction of Questionnaire:** Here, we talk about the appearance of the questionnaire, i.e. <mark>the quality of paper on which the questionnaire is either written or printed</mark>. In case, the questionnaire is reproduced on a poor-quality paper; then the respondent might feel the research is unimportant due to which the quality of response gets adversely affected.

Thus, it is recommended to reproduce the questionnaire on a good-quality paper having a professional appearance. In case, the questionnaire has <mark>several pages, then it should be presented in the form of a booklet</mark> rather than the sheets clipped or stapled together.

11. **Pretesting:** Pretesting means <mark>testing the questionnaires on a few selected respondents or a small sample</mark> of actual respondents with a purpose of improving the questionnaire by identifying and eliminating the potential problems. All the aspects of the questionnaire must be tested such as <mark>question content, structure, wording, sequence, form and layout, instructions, and question difficulty</mark>. The researcher must ensure that the respondents in the pretest should be similar to those who are to be finally surveyed.

Thus, the questionnaire design is a multistage process that requires the researcher's attention to many details.

	One word question answer Module - 3 Chapter -2	
Sr. No	Question	Answer
1	What it means assigning numbers or other symbols to characteristics of objects according to certain pre-specified rules?	measurement
2	How many data measurement scale is there?	4
3	Name the four data measurement scale.	ordinal, nominal, interval, ratio
4	If data are labels or names used to identify the attribute of an element, then the _____ is used.	nominal scale
5	Which scale is used to rank or order objects?	ordinal scale
6	An interval scale is also called a _____	cardinal scale
7	With the help of which scale researchers can obtain a better comparison between the objects?	interval scale
8	_____scales, numbers form a continuum and provide information about the amount of difference, but the scale lacks a true zero.	in interval
9	_____ have all of the characteristics of interval scales as well as a true zero, which refers to complete absence of the characteristic being measured.	ratio scale

10	What is validity?	ability of an instrument to measure what is designed to measure.
11	How many types of validity are there?	3
12	Name different type of validity.	content, construct & criterion
13	If the instrument contains a representative sample of the universe, the_____ is good.	content validity
14	Which validity involves the determination of whether the scale is able to perform up to the expectation with respect to the other variables or criteria?	criterion
15	Which validity is the initial concept, idea, question, or hypothesis that determines which data are to be generated and how they are to be gathered?	construct
16	_____ refers to whether or not you get the same answer by using an instrument to measure something more than once.	reliability
17	How many types of reliability are there?	3
18	Name the 3 reliability.	test-retest, parallel form, inter-rater
19	Which reliability relates to measure of reliability that has been obtained by conducting the same test more than one time over period of time with the participation of the same sample group?	test-retest
20	_____reliability relates to a measure that is obtained by conducting assessment of the same phenomena with the participation of the same sample group via more than one test method.	parallel form
21	_____ reliability as the name indicates relates to the measure of sets of results obtained by different researcher using same methods.	inter rater
22	In which scaling there is a direct comparison of stimulus object?	comparative

23	Which scaling is also known as nonmetric scaling?	comparative
24	Which comparison symbolizes two variables from which the respondent needs to select one?	paired comparision
25	Which technique is mainly used at the time of product testing, to facilitate the consumers with a comparative analysis of the two major products in the market.	paired comparison
26	In which order scaling the respondent needs to rank or arrange the given objects according to his or her preference?	rank order scaling
27	_____ is a scaling technique where a continual sum of units like dollars, points, chits, chips, etc.	constant sum
28	Which scaling is a technique used for sorting the most appropriate objects out of a large number of given variables?	Q-sort
29	Which scaling is suitable in the case where the number of objects is not less than 60 and more than 140?	Q sort
30	_____ scale is used to analyse the performance of an individual product or object on different parameters.	non-comparative
31	_____ is a graphical rating scale where the respondents are free to place the object at a position of their choice.	continuous rating scale
32	Which scale emphasizes on choosing a particular category among the various given categories by the respondents?	itemized rating scale
33	In _____ the researcher provides some statements and ask the respondents to mark their level of agreement or disagreement	likert rating scale
34	_____ A bi-polar seven-point non-comparative rating scale is where the respondent can mark on any of the seven points for each given attribute of the object as per personal choice.	semantic differential scale

35	_____ is generally presented vertically with a single adjective or phrase in the centre of positive and negative ratings.	staple scale
36	Who has developed research questionnaire?	Statistical Society of London.
37	What has been developed by statistical society of London?	research questionnaire
38	In which year Research questionnaires were developed?	1838
39	Structured questionnaires collect _____	quantitative data.
40	Unstructured questionnaires collect _____	qualitative data.
41	_____ questions help collect qualitative data in a questionnaire where the respondent can answer in a free form with little to no restrictions.	Open-ended
42	_____ question is generally a "yes/no" close-ended question	dichotomous
43	Which type of questionnaire is yes/no close ended.	dichotomous
44	In which type of qestion respondent has to select one (single-select multiple-choice question) or many (multi-select multiple choice question)?	multi choised question
45	_____questions are based on the principles of the four measurement scales – nominal, ordinal, interval, and ratio.	scaling questions
46	In _____respondents are asked a question, and the answer choices are images.	pictorial questions